UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/766,164	01/28/2004	Furquan A. Ansari	Ansari 1-2	3389

46850   7590   02/06/2008
MENDELSOHN & ASSOCIATES, P.C.
1500 JOHN F. KENNEDY BLVD., SUITE 405
PHILADELPHIA, PA 19102

EXAMINER
BARQADLE, YASIN M

ART UNIT	PAPER NUMBER
2153	

MAIL DATE	DELIVERY MODE
02/06/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

PTOL-90A (Rev. 04/07)

Office Action Summary	Application No.	Applicant(s)
	10/766,164	ANSARI ET AL.
	Examiner	Art Unit	
	Yasin M. Barqadle	2153	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>19 November 2007</u>.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-22</u> is/are pending in the application.

     4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-22</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

     a)☐ All   b)☐ Some * c)☐ None of:

        1.☐ Certified copies of the priority documents have been received.

        2.☐ Certified copies of the priority documents have been received in Application No. _____.

        3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

     * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO/SB/08)
     Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
     Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

Response to Amendment

1.   The amendment filed on November 19, 2007 has been fully

considered but are moot in view of the new ground(s) of

rejection necessitated by amendment.

* Note : New examiner has been assigned to this

    Application.

* Claims 1-22 are presented for examination.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as
> set forth in section 102 of this title, if the differences between the subject matter sought to be
> patented and the prior art are such that the subject matter as a whole would have been obvious at
> the time the invention was made to a person having ordinary skill in the art to which said subject
> matter pertains. Patentability shall not be negatived by the manner in which the invention was
> made.

2.   Claims 1-5, 8-14, and 16-22 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Funato et al. ("TCP-R: TCP Mobility Support for Continous

operation", NETWORK PROTOCOLS, 1997) in view of Gannage et al US Pub.

20040151158, hereinafter "Gannage".

For claim 1 and 21:

A method of migrating from a current endpoint address to a new endpoint address by a migrator (See Page 232, Fig. 2, MH) during a session between the migrator and a non-migrator (See Page 232, FIG. 2, CH) in a packet-based communication system, the method comprising the steps of:

(a) changing, in the migrator, the current endpoint address to the new endpoint address (mobile host changes its end point address; see page 233, first column, second Para, last line, "... the MH also revises its own pair of addresses");

(b) suspending transmission to the non-migrator of packets with the new endpoint address (Disconnect with CH and maintaining the TCP/IP connection means suspension of connection, See Figure 2 (shown above), disconnect between CH and MH under the dotted line);

(c) informing the non-migrator of the change to the new endpoint address (redirect message is notifying change of address, see page 232, second column, second Para from bottom, last line, "After the MH obtains a new IP address, the MH sends a redirect message to its correspondent host(CH).") ;

(d) resuming transmission to the non-migrator of packets with the

new endpoint address (Resumed to communicate with revise TCP connection is resumption of transmission; see page 233, first column, third Para from top, "They [MH and CH] resume to communicate with the revised TCP connection").

Although Funato shows substantial features of the claimed invention, Funato does not explicitly show using a channel separate from the channel of the session between migrator and the non-migrator to inform changes. Nonetheless, this feature is well known in the art and would have been an obvious modification of the system disclosed by Funato, as evidenced by Gannage USPN. (20040151158).

In analogous art, Gannage disclose "Notifications are out-of-band signals in that they occupy a totally separate channel from the main message channel. Examples of this are notifications that are established over TCP/IP sockets whereas the messages themselves are sent as HTTP traffic." (¶ 0023).

Giving the teaching of Gannage, a person of ordinary skill in the art would have readily recognized the desirability and the advantage of modifying Funato by employing the separate channel notification system of Gannage to prevent overloading the existing session channel between the migrator and non-migrator with notification information. By

send notification messages in a separate out of band channel will result

a faster data deliver and reduction of transport data delays.

For claim 2:

The invention of claim 1 (see supra for claim 1 discussion), wherein

step (a) comprises the steps of logically changing to the new endpoint address

and updating a kernel structure of the migrator (For TCP-R to work correctly,

both migratory and non-migrator end point address needed to be updated.

See page 235, first column, first Para, lines 2 , "... it changes dstaddr in its 4-

tupel [another implied tuple representing tcp, total five tuples], ... these

operations are needed by both ends [i.e. both migratory and non-migrator] of

the connection.")

The invention of claim 2 (See supra for discussion claim 2), wherein the

migrator changes to the new current address by changing from a current 5-

tuple comprising the current endpoint address to a new 5-tuple.comprising the

new endpoint address (The TCP address is identified by five tuples, Protocol,

TCP (implied in the implementation), Source address, source port, destination

address (dstaddr), and destination port (dstport), see page 234, second

column, last para, lines 2-3, "TCP connections are identified by a 4-tuple

of {srcaddr, srcport, dstaddr, dstport}"), and updating the kernel structure of the migrator comprises modifying a socket with the current 5-tuple to reflect the new 5- tuple, the socket being associated with the session (Changing the destination address and rehashing hash entry is updating the kernel structure and if socket address is not updated, TCP-R will not function, see Page 235, first Para, lines , "When a redirection segment arrives to a host which supports TCP-R, it changes destaddr in its 4-tuple and rehashes the hash entry related to its correspondent host. To achieve the redirect operation correctly, these operations are needed by both ends of the connection.").

For claim 4:

The invention of claim 2 (see supra claim 2 discussion), wherein step (a) comprises the steps of registering with the non-migrator (revising pair of addresses is the registration of address, See page 233, second Para from top, lines 2-3 "CH revises the pair of addresses of the existing TCP connection.")

before initiating the change to the new endpoint address (sending the redirect message is initiating change to the new end point address, See page 232, second Para from bottom, last tow lines, "... MH sends a redirect message to its correspondent host (CH)".

For claim 5:

The invention of claim 1 (see supra for claim 1 discussion), wherein step (b) comprises the steps of dropping packets from the non-migrator received at the network layer and suspending transmission of packets to the non-migrator at the transport layer (When tcp connection between MH and CH are disconnected, the network layer will drop any packets addressed to the CH; while maintaining the tcp/ip connection, if tcp connection is disconnected and resumed between CH and MH, it is equivalent to suspending, see page 232, Figure 2, for disconnect MH and CH and see page 233, column 1, Para 3 from top, first line, "They resume to communicate with revised TCP connection).

For claim 6:

The invention of claim 5, wherein the step of suspending transmission of packets to the non-migrator at the transport layer (since mobile host (migratory) has disconnected while maintaining TCP connection, the migratory must have stopped sending the packets; see Page 232, Figure 2) suspends packet

transmission during a race condition with firewall-filtering rules.

For claim 8:

The invention of claim 1 (See supra for claim 1 discussion), wherein step (c) comprises the steps of sending a control message to the non-migrator informing the non-migrator of the change to the new endpoint address (sending redirect message is notifying change of end point address; see page 232, second column, second Para from bottom, last line, "MHO sends a redirect message to its correspondent host (CH).") and receiving a confirmation from the non-migrator that the non-migrator has changed to the new endpoint address (Receiving AT_REQ in rd_snt state by migrator is equivalent to receiving confirmation that non-migrator has changed the end point address; See Page 233, section 4.3 details of RD-SNT, "After RD-REQ is sent to the mobile host side, the mobile host [migratory] enters the RD_SENT state When the mobile host [migrator] receives the authentication segment (AT_REQ) in this state, it sends a calculated identifier to the peer. Then it [migrator] to the established state" and RD_RCVD, "When the correspondent host [non-migrator] RD_REQ, it [non-migrator] enters the RD RCVD state. ... it [non-migrator] just sends an AT REQ segmentand

—

enters ESTAB state.";).

The invention of claim 1 (see supra for claim 1 discussion), wherein, for steps (a) through (d), the session conforms to a transmission control

protocol and an Interact protocol (TCP redirection is an extention to TCP/IP and therefore conforms to the TCP/IP; See abstract, first line, "The TCP-R (TCP redirection) is an extension of the TCP ...").

For claim 10:

The invention of claim 1 (see supra for claim 1 discussion), wherein the method is implemented in a processor of a node in a packet network (MH is a portable computer implementing claim 1 and further described as frequently changing IP address, therefore, MH is processor implemented in a single node; see Page 229, section 1, introduction, first Para, lines 6-8, "so they [portable computers] may change IP addresses when the ..") .

For claim 11:

The invention of claim 10 (see supra for claim 10 discussion), wherein, for step (d), the session comprises packets exchanged between the migrator and non-migrator in at least one of a wired communication network (10BaseT Ethernet is a wired communication; see Page 235, second column, Section 5.5, first Para, line 7, "10BaseT Ethernet is used as the data link layer.") and a . wireless communication network (When the machines are moved between the cells, they are in wireless communication network, See page 229, first column,

section 1 introduction, lines 6-8, "so they may frequently change IP

addresses when the machines are moved between cells.").

For claim 12, 21 and 22:

A. method of migrating from a current endpoint address to a new

endpoint address by a non-migrator (See Page 232, Figure 2, CH is non-

migrator) during a session between the non-migrator and a migrator (See

Page 232, Figure 2, MH is migrator) in a packet-based communication

network (CP implies packet based network, see abstract, first line, "The TCP-

R (TCP Redirection) is an extension of TCP ..."), the method comprising the

steps of:

(a) receiving a control message indicating the migrator's change to the

new endpoint address (See MH sending the redirect message is control

message, see page 232, second column, second Para, from the bottom, last

line "... MH sends a redirect message to its correspondent host(CH).") ;

(b) changing, in the non-migrator, the current endpoint address to the

new endpoint address (see page 233, first column, second Para, line

2, "... CH revises the pair of addresses ...");

(c) acknowledging, to the migrator, the non-migrator's change to the

new endpoint address (Receiving AT_REQ in rd_snt state by migrator is

equivalent to receiving acknowledgment that non-migrator has changed the end point address; See Page 233, section 4.3 details of RD-S NT, "After RD-REQ is sent to the

mobile host side, the mobile host [migratory] enters the RD_SENT state When the mobile host [migrator] receives the authentication segment (AT_REQ) in this state, it sends a calculated identifier to the peer. Then it [migrator] to the established state" and RD_RCVD, "When the correspondent host [non-migrator] RD_REQ, it [non-migrator] enters the RD_RCVD state. ... it [non-migrator] just sends an AT REQ segment and enters ESTAB state.";) ; and

(d) exchanging, with the migrator, packets of the session with the new endpoint address (Resuming communication, is exchange of packets, See page 233, first column, third Para, first line, "They [MH and CH] resume to communicate with the revised TCP connection.").

Although Funato shows substantial features of the claimed invention, Funato does not explicitly show using a channel separate from the channel of the session between migrator and the non-migrator to inform changes. Nonetheless, this feature is well known in the art and would have been an obvious modification of the system disclosed by Funato, as evidenced by Gannage USPN. (20040151158).

In analogous art, Gannage disclose "Notifications are out-of-band signals in that they occupy a totally separate channel from the main message channel. Examples of this are notifications that are established over TCP/IP sockets whereas the messages themselves are sent as HTTP traffic." (¶ 0023). Giving the teaching of Gannage, a person of ordinary skill in the art would have readily recognized the desirability and the advantage of modifying Funato by employing the separate channel notification system of Gannage to prevent overloading the existing session channel between the migrator and non-migrator with notification information. By send notification messages in a separate out of band channel will result a faster data deliver and reduction of transport data delays.

For claim 13:

The invention of claim 12 (see supra for claim 12 discussion), wherein step (b) comprises the steps of logically changing to the new endpoint address and updating a kernel structure of the non- migratory (For TCP-R to work correctly, both migratory and non-migrator end point address needed to be updated. See page 235, first column, first Para, lines 2 , "... it changes dstaddr in its 4-tupel [another implied tuple representing tcp,

total five tuples], ... these operations are needed by both ends [i.e. both migratory and non-migrator] of the connection.").

The invention of claim 13 (see supra claim 13 for discussion), wherein the non-migrator changes to the new current address by changing from a current 5- tuple comprising the current endpoint address to anew 5-tuple comprising the new endpoint address (The TCP address is identified by five tuples, Protocol, TCP (implied in the implementation), Source address, source port, destination address (dstaddr), and destination port (dstport), see page 234, second column, last para, lines 2-3, "TCP connections are identified by a 4-tuple of {srcaddr, srcport, dstaddr, dstport}") and updating the kernel structure of the non-migrator comprises modifying a socket with the current 5-tuple to reflect the new 5-tuple, the socket being associated with the session (Changing the destination address and rehashing hash entry is updating the kernel structure and if socket address is not updated, TCP-R will not function, see Page 235, first Para, lines , "When a redirection segment arrives to a host which supports TCP-R, it changes destaddr in its 4-tuple and rehashes the hash entry related to its correspondent host. To achieve the redirect operation correctly, these operations are needed by both ends of the connection.").

For claim 15:

The invention of claim 13 (see supra for claim 13 discussion),

wherein step (a) comprises the steps of:

registering the migrator before receiving the control message (to

detect change in IP address by an external daemon requires registration of

change of

address with daemon; see page 231, second column, first Para from bottom,

first line, "... TCP-R assumes that each mobile host can detect the change of

its IP address some how. ... **_external daemons_** may be required for this

assumption".

For claim 16:

The invention of claim 12, wherein step (b) includes the step of

continuing to receive packets from the migrator during the change (Since

Disconnect while maintaining TCP connection is equivalent to suspension,

and before resuming the connection the packets of RD-REQ, AT-REQ, and

AT_REP are exchanged between CP and MH, packets are exchanged

between CH and MH, See page 232, Figure 2 in conjunction with Page 233,

Section 4.3).

For claim 17:

The invention of claim 12, wherein, for step (d), the session conforms to a transmission control protocol and an Internet protocol (TCP extensions conform to TCP/IP, see Page 229, Abstract, first line, "The TCP-R (TCP Redirection) is an extension of TCP ...").

For claim 18:

The invention of claim 12, wherein the method is implemented in a

5.5, first Para, lines 5-7, "... IBM PC/AT Compatibles (Pentium 166 MHz, Free BSD) as CH ...").

For claim 19:

The invention of claim 18, wherein, for step (d), the session comprises packets exchanged between the migrator and non-migrator in at least one of a wired communication network (10BaseT Ethernet is a wired communication; see Page 235, second column, Section 5.5, first Para, line 7, "10BaseT Ethernet is used as the data link layer.") and wireless communication network (When the machines are moved between the cells, they are in wireless communication network, See page 229, first column, section 1 introduction, lines 6-8, "so they may frequently change IP addresses when the machines are moved between cells.").

For claim 20:

A network comprising:

a migrator adapted to migrate from a current endpoint address to a

new endpoint address during a session; and

a non-migrator adapted to migrate from a current endpoint address to

a new endpoint address during a session, wherein the migrator is adapted

to:

i) change, in the migrator, the current endpoint address to the
new

endpoint address (mobile host (migrator) changes its end point address,

see page 233, first column, second Para, last line, "... the MH also

revises its own pair of addresses"),

ii) suspend transmission to the non-migrator of packets with

the new endpoint address (Disconnect with CH and maintaining the

TCP/IP connection means suspension of connection, See Figure 2

(shown above), disconnect between CH and MH before the dotted

line),

(iii) inform the non-migrator of the change to the new endpoint

address (redirect message is notifying change of address, see page

232, second column, second Para from bottom, last line, "After the

MH obtains a new IP address, the MH sends a redirect message to its

correspondent host(CH)."), and

iv) resume transmission to the non-migrator of packets with the new endpoint address(Resumed to communicate with revise TCP connection is resumption of transmission, See page 233, first column, third para from top, "They [MH and CH] resume to communicate with the revised TCP connection"), and

wherein the non-migrator is adapted to:

i) receiving a control message indicating the migrator's change to the new endpoint address (See MH sending the redirect message is control message, see page 232, second column, second Para, from the bottom, last line "... MH sends a redirect message to its correspondent host(CH)."),

ii) change, in the non-migrator, the current endpoint address to the new endpoint address (see page 233, first column, second Para, line 2, "... CH revises the pair of addresses ..."),

(iii) acknowledge, to the migrator, the non-migrator's change to the new endpoint address (Receiving AT_REQ in rd_snt state by migrator is equivalent to receiving acknowledgment that non-migrator has changed the end point address; See Page 233, section 4.3 details of RD-SNT, "After RD-REQ is sent to the mobile host side, the mobile

host [migratory] enters the RD SENT state ... When the mobile host [migrator] receives the authentication segment (AT_REQ) in this state; it sends a calculated identifier to the peer. Then it [migrator] to the established state" and RD_RCVD, "When the correspondent host [non-migrator] RD_REQ; it [non-migrator] enters the RD_RCVD state. ... it [non-migrator] just sends an AT REQ segment and enters ESTAB state.";), and

(iv) exchange with the migrator, packets of the session with the new endpoint address (Resuming communication, is exchange of packets, See page 233, first column, third Para, first line, "They [MH and CH] resume to communicate with the revised TCP connection."). Although Funato shows substantial features of the claimed invention, Funato does not explicitly show using a channel separate from the channel of the session between migrator and the non-migrator to inform changes.

Nonetheless, this feature is well known in the art and would have been an obvious modification of the system disclosed by Funato, as evidenced by Gannage USPN. (20040151158).

In analogous art, Gannage disclose "Notifications are out-of-band signals in that they occupy a totally separate channel from the main

message channel. Examples of this are notifications that are established
over TCP/IP sockets whereas the messages themselves are sent as
HTTP traffic." (¶ 0023).

Giving the teaching of Gannage, a person of ordinary skill in the art
would have readily recognized the desirability and the advantage of
modifying Funato by employing the separate channel notification system
of Gannage to prevent overloading the existing session channel
between the migrator and non-migrator with notification information. By
send notification messages in a separate out of band channel will result
a faster data deliver and reduction of transport data delays.

3.   Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over
Funato et al. in view of Stockwell 6072942).

Funato teaches the invention as described in 1 and 5. However, Funato does not
teach preventing or resolving race condition by applying one or more firewall rules to
prevent session data from leaving the system.
Nonetheless using firewall rules to prevent certain session data to come in or leave
from a system is well known in the art. One ordinary skill in the art at the of the
invention would use firewall rules to prevent race condition by delaying or queuing
session data until the completion of migration packet processing is completed. In

doing so well known problems associated with race condition are avoided. (see (Stockwell Patent No. 6072942 col. 16, lines 33-43). See also Bowman-Amuah US Patent No. (6332163) "In order to prevent potential race conditions the client must be given sufficient time to respond to the keep alive message from the server before the context is deleted. Typically the client has a separate listener for upward messages originating at the server, so queuing is not an issue at the client end. However, a server is more likely to queue on the receiving end, especially in a system with high message rates." (col. 263, lines 57-67).

4.   Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Funato et al. in view of Westphal (US 2004/0202160).

· For claim 7

Funato et al. teaches everything except (see supra claim 6 discussion) except dynamically adding and withdrawing firewall rules.

The general concept of updating (adding or withdrawing) firewall rules is well known in the art as illustrated by Westphal (see Page 4, Para 38, lines 4-5, "... firewall rules can be update[d] i[a]s necessary.")

It would have been obvious to one in skilled in the art at the time of the invention to modify Funato et al. to update the firewall rules in order to be

able to communicate through firewall after end point address update as taught by Westphal (updating the firewall rules was necessary because of change in endpoint address, which is implicit benefit in the reference teaching)..

Conclusion

ACTION IS MADE FINAL. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

The prior made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yasin Barqadle whose telephone number is 571-272-3947. The examiner can normally be reached on 9:00 AM to 5:30 PM.
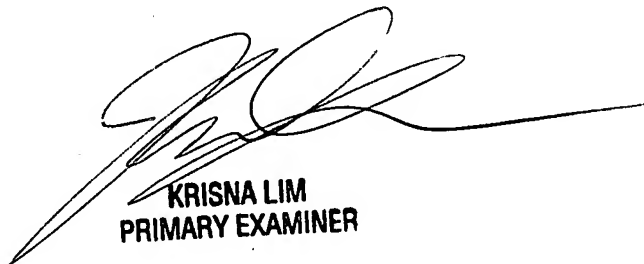
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Burgess can be reached on 571-272-3949. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9306 for regular communications and 703-746-7238 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

Information regarding the status of an application may be obtained form the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either private PAIR or public PAIR system. Status information for unpublished applications is available through private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

YB

Art Unit 2153

KRISNA LIM
PRIMARY EXAMINER